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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,048	08/29/2003	Pradeep K. Govil	1857.2010000	8531

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EXAMINER

DINH, JACK

ART UNIT PAPER NUMBER

2873

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/651,048

Applicant(s)

GOVIL ET AL.

Examiner

Jack Dinh

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 11, 27, 29 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 11, 27, 29 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0505</u> . | 6) <input checked="" type="checkbox"/> Other: <u>DETAILED ACTION</u> . |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US Patent 6,249,370).

Regarding claim 1, Takeuchi (figure 26) is interpreted as disclosing a spatial light modulator comprising reflective devices 50, a solid and substantially rigid substrate 28, and an actuator comprising actuator elements 32 and first 34b and second sets 34a of electrodes, wherein respective electrodes in the first set of electrodes are coupled to a first portion of respective ones of the actuator elements and are coupled to respective ones of the reflective devices, and wherein respective electrodes in the second set of electrodes are coupled to a second portion of the respective ones of the actuator elements and are coupled to the solid and substantially rigid substrate. Figure 26 of Takeuchi is interpreted as disclosing all the claimed limitations except that the substrate is continuous. However, numerous of Takeuchi's embodiments disclose a continuous substrate 28 as shown in figure 1. Such continuity or discontinuity would not alter the operation of the device. In addition, the Applicant has not disclosed any unexpected result this continuity of the substrate would have over that of the prior

Art Unit: 2873

art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a continuous substrate for the purpose of simplifying the design by reducing the number of individual substrates.

Regarding claim 2, Takeuchi (figure 26) is interpreted as further disclosing that the actuator elements and electrodes are configured to move the reflective devices in two directions (see figure).

Regarding claim 10, Takeuchi (figure 26) is interpreted as further disclosing that the actuator elements are configured such that the reflective devices form an overall curved shape (see figure).

2. Claims 3-5, 7, 8, 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US Patent 6,249,370), as applied in claim 1, in view of Makino et al. (US Patent 6,549,694).

Regarding claim 3, Takeuchi is interpreted as disclosing all the limitations, as described above, except that the actuator elements and electrodes are configured to move the reflective elements in four directions. Within the same field of endeavor, Makino is interpreted as disclosing that reflective elements move in four directions are well known, such as tilting (left and right) as shown in figure 5 or moving vertically (up and down) as shown in figures 6A and 6B. Therefore, it would have been obvious to one having ordinary skill in the art at the time that

Art Unit: 2873

the invention was made to provide reflective elements move in four directions, as taught by Makino, for the purpose of increasing the reflective elements' functionality.

Regarding claims 4 and 5, Makino (figure 5) is interpreted as further disclosing that each of the second array of electrodes comprises first and second electrode sections **107a** and **107b** configured to allow the actuator elements to tilt the reflective devices.

Regarding claim 7, Makino (figure 6B) is interpreted as further disclosing that adjacent ones of the actuator elements have different heights (see figure).

Regarding claims 8 and 27, Makino (figure 5) is interpreted as further disclosing that the actuator elements moves the reflecting device about one-quarter of a wavelength of light in each direction (col. 2, lines 47-54).

Regarding claim 11, Makino et al. (figure 5) is interpreted as further that the actuator elements **108** are formed in varying heights and positions on the substrate, such that varying wavefront patterns are generated by light reflecting therefrom.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US Patent 6,249,370), as applied in claim 1, in view of Amm et al. (US Patent 6,639,722).

Regarding claim 6, Takeuchi et al. is interpreted as disclosing all the limitations, as described above, except for a first coupling device and a second coupling device. Within the

Art Unit: 2873

same field of endeavor, Amm et al. (figure 3A and 3B) is interpreted as disclosing a teaching of a configuration wherein the actuator elements can be controlled in groups. Although the drawing does not explicitly shows the coupling features, the teaching would strongly suggest that such coupling features would have been obvious modifications to one of ordinary skill from the spatial light modulator of Takeuchi et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time that the invention was made to a first and a second coupling device, as suggested by Amm et al., for the purpose of controlling the adjacent actuator elements in groups.

4. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US Patent 6,249,370), as applied in claim 1, in view of Frische et al. (US Patent 5,493,623).

Regarding claim 6, Takeuchi et al. is interpreted as disclosing all the limitations, as described above, except that the electrodes cause a PZT material of the actuator elements to expand and contract to move the reflective devices. However, piezoelectric (PZT) type actuator is well-known in the art. Within the same field of endeavor, Frische et al. is interpreted as disclosing the teaching of a modulator application wherein electrical excitation to the electrodes causes the PZT material of the actuator elements to expand and contract. Therefore, it would have been obvious to one having ordinary skill in the art at the time that the invention was made to use a PZT material, as taught by Frische et al., for the purpose of actuating the modulator.

Art Unit: 2873

Other Information/Remarks

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Dinh

A handwritten signature in black ink, appearing to read 'D. Spector', with a long horizontal line extending to the right.

**DAVID SPECTOR
PRIMARY EXAMINER**